CLMPTO

10/743476

06/21/04

DH

1. (Original)   A proactive user interface for a computational device, the computational device having an operating system, comprising:

(a)   a user interface for communicating between the user and said operating system; and

(b)   a learning module for detecting at least one pattern of interaction of the user with said user interface and for proactively altering at least one function of said user interface according to said detected pattern.

2. (Original)   The proactive user interface of claim 1, wherein said at least one pattern is selected from the group consisting of a pattern determined according to at least one previous interaction of the user with said user interface, and a predetermined pattern, or a combination thereof.

3. (Original)   The proactive user interface of claim 1, wherein said user interface features a graphical display and said altering at least one function of said user interface comprises altering at least a portion of said graphical display.

4. (Original)   The proactive user interface of claim 3, wherein said altering at least a portion of said graphical display comprises:

selecting a menu for display according to said detected pattern; and

displaying said menu.

5. (Original)   The proactive user interface of claim 4, wherein said selecting said menu comprises:

constructing a menu from a plurality of menu options.

6. (Original)   The proactive user interface of claim 1, wherein said user interface features an audio display and said altering at least one function of said user interface comprises altering at least one audible sound produced by the computational device.

7. (Original) The proactive user interface of claim 1, wherein the computational device is selected from the group consisting of a personal computer, an ATM, a mobile information device, or a consumer appliance having an operating system.

8. (Original) The proactive user interface of claim 1, wherein said learning module maximizes a percentage of proactive alterations leading to a direct user selection from said alteration.

9. (Original) The proactive user interface of claim 8, wherein said maximization is performed through learning reinforcement.

10. (Original) The proactive user interface of claim 9, wherein said learning reinforcement is performed through an iterative learning process.

11. (Original) The proactive user interface of claim 10, wherein each iteration of said learning process is performed after said alteration has been performed.

12. (Original) The proactive user interface of claim 1, wherein said proactively altering at least one function of said user interface comprises activating an additional software application through the operating system.

13. (Original) The proactive user interface of claim 1, further comprising a knowledge base for holding information gathered by said learning module as a result of interactions with the user and/or the operating system.

14. (Original) The proactive user interface of claim 13, wherein said learning module further comprises a plurality of sensors for perceiving a state of the operating system.

15. (Original) The proactive user interface of claim 14, wherein said learning module further comprises a perception unit for processing output from said sensors to determine a state of the operating system and a state of said user interface.

16. (Original) The proactive user interface of claim 15, wherein said learning module further comprises a reasoning system for updating said knowledge base and for learning an association between an alteration of said user interface and a state of the operating system.

17. (Original) The proactive user interface of claim 13, further comprising a plurality of integrated knowledge bases determined from the behavior of the user and from preprogrammed information.

18. (Original) The proactive user interface of claim 1, wherein said learning module further comprises at least one of an artificial intelligence algorithm and a machine learning algorithm.

19. (Original) The proactive user interface of claim 1, further comprising a user model for modeling behavior of the user.

20. (Original) The proactive user interface of claim 19, wherein learning module uses said user model to detect an implicit preference of the user according to a reaction of the user to said user interface.

21. (Original) A method for a proactive interaction between a user and a computational device through a user interface, the computational device having an operating system, the method comprising:

detecting a pattern of user behavior according to at least one interaction of the user with the user interface; and

proactively altering at least one function of the user interface according to said pattern.

22. (Original) The method of claim 21, wherein said at least one pattern is selected from the group consisting of a pattern determined according to at least one previous interaction of the user with said user interface, and a predetermined pattern, or a combination thereof.

23. (Original) The method of claim 21, wherein said user interface features a graphical display and said altering at least one function of said user interface comprises altering at least a portion of said graphical display.

24. (Original) The method of claim 23, wherein said altering at least a portion of said graphical display comprises:
selecting a menu for display according to said detected pattern; and
displaying said menu.

25. (Original) The method of claim 24, wherein said selecting said menu comprises:
constructing a menu from a plurality of menu options.

26. (Original) The method of claim 21, wherein said user interface features an audio display and said altering at least one function of said user interface comprises altering at least one audible sound produced by the computational device.

27. (Original) The method of claims 21, wherein the computational device is selected from the group consisting of a personal computer, an ATM, a mobile information device, or a consumer appliance having an operating system.

28. (Original) The method of claim 21, wherein said learning module maximizes a percentage of proactive alterations leading to a direct user selection from said alteration.

29. (Original) The method of claim 28, wherein said maximization is performed through learning reinforcement.

30. (Original) The method of claim 29, wherein said learning reinforcement is performed through an iterative learning process.

31. (Original) The method of claim 30, wherein each iteration of said learning process is performed after said alteration has been performed.

32. (Original) The method of claim 21, wherein said proactively altering at least one function of said user interface comprises activating an additional software application through the operating system.

33. (Original) The method of claim 21, further comprising a knowledge base for holding information gathered by said learning module as a result of interactions with the user and/or the operating system.

34. (Original) The method of claim 33, wherein said learning module further comprises a plurality of sensors for perceiving a state of the operating system.

35. (Original) The method of claim 34, wherein said learning module further comprises a perception unit for processing output from said sensors to determine a state of the operating system and a state of said user interface.

36. (Original) The method of claim 35, wherein said learning module further comprises a reasoning system for updating said knowledge base and for learning an association between an alteration of said user interface and a state of the operating system.

37. (Original) The method of claim 36, further comprising a plurality of integrated knowledge bases determined from the behavior of the user and from preprogrammed information.

38. (Original) The method of claim 21, wherein said learning module further comprises at least one of an artificial intelligence algorithm and a machine learning algorithm.

39. (Original) The method of claim 38, wherein learning module uses said user model to detect an implicit preference of the user according to a reaction of the user to said user interface.

40. (Original) A proactive computational device for interacting with a user, the computational device having an operating system, the device comprising:

(a) a user interface for communicating between the user and the operating system; and

(b) a learning module for detecting at least one pattern of interaction of the user with said user interface and for proactively altering at least one function of said user interface according to said detected pattern.

41. (Original) A behavioral system for a mobile information device having an operating system, comprising:

an adaptive system for the mobile information device, wherein said adaptive system alters at least one function of the mobile information device according to an analysis of user behavior rather than a direct user command to alter said at least one function.

42. (Original) The system of claim 41, wherein the operating system comprises an embedded system.

43. (Original) The system of claim 41, wherein the mobile information device comprises a cellular telephone.

44. (Original) The system of claim 41, wherein said analysis of user behavior comprises an analysis of a plurality of user interactions with the mobile information device.

45. (Original) The system of claim 44, wherein said analysis further comprises comparison of said plurality of user interactions to at least one predetermined pattern, wherein said at least one predetermined pattern is associated with altering said at least one function.

46. (Original) The system of claim 44, wherein said analysis further comprises comparison of said plurality of user interactions to at least one pattern of previously detected user behavior, wherein said at least one pattern of previously detected user behavior is associated with altering said at least one function.

47. (Original) The system of claim 41, wherein said at least one function comprises an audio capability by the mobile information device.

48. (Original) The system of claim 47, wherein said audio capability comprises producing an audible sound by the mobile information device.

49. (Original) The system of claim 48, wherein said audible sound comprises at least one of a ring tone, an alarm tone and an incoming message tone.

50. (Original) The system of claim 47, wherein said audio capability comprises receiving and interpreting an audible sound by the mobile information device.

51. (Original) The system of claim 41, wherein said at least one function is related to a visual display by the mobile information device.

52. (Original) The system of claim 51, wherein said at least one function comprises displaying a menu.

53. (Original) The system of claim 41, wherein said adaptive system is operated by the mobile information device.

54. (Original) The system of claim 41, wherein the mobile information device is capable of communication through a network.

55. (Original) The system of claim 54, wherein said adaptive system is operated at least partially according to commands sent from said network to the mobile information device.

56. (Original) The system of claim 55, wherein data associated with at least one operation of said adaptive system is stored at a location other than the mobile information device, said location being accessible through said network.

57. (Original) The system of claim 41, further comprising a learning module, wherein said analysis is performed by said learning module and wherein said learning module adapts to said user behavior according to at least one of an AI algorithm, an ML algorithm or a genetic algorithm.

58. (Original) A proactive mobile information device, comprising an adaptive system for the mobile information device, wherein said adaptive system alters at least one function of the mobile information device according to an analysis of user behavior rather than a direct user command to alter said at least one function.

59. (Original) A method for adapting at least one function of a mobile information device for a user, comprising:

analyzing a plurality of user interactions with the mobile information device to form an analysis; and

proactively altering at least one function of the mobile information device according to said analysis rather than a direct user command to alter said at least one function.

60. (Original) An intelligent agent for use with a mobile information device over a mobile information device network, comprising:

an avatar for providing a user interface with the intelligent agent; and

an agent for controlling an interaction of the mobile information device through the mobile information device network.

61. (Original) The agent of claim 60, wherein said avatar and said agent are operated by the mobile information device.

62. (Original) The intelligent agent of claim 60, wherein the mobile information device is in communication with at least one other mobile information device, said at least one mobile information device being associated with a second agent, such that said agent is capable of communicating with said second agent.

63. (Original) The intelligent agent of claim 62, wherein the mobile information device is in communication with at least one other mobile information device through the mobile information device network.

64. (Original) The intelligent agent of claim 62, wherein the mobile information device is in direct communication with at least one other mobile information device, without the mobile information device network.

65. (Original) The intelligent agent of claim 62, wherein said at least one other mobile information device is associated with a second avatar, and wherein a user of the mobile information device and a user of said at least one other mobile information device communicate through said avatar and said second avatar.

66. (Original) The intelligent agent of claim 64, wherein said communication is related to a game.

67. (Original) The intelligent agent of claim 66, wherein said game comprises a role-playing game.

68. (Original) The intelligent agent of claim 60, wherein at least one of said avatar or said agent are operated at least partially according to commands sent from the mobile information device network to the mobile information device.

69. (Original) The intelligent agent of claim 68, wherein data associated with at least one operation of said at least one of said avatar or said agent is stored at a location other than the mobile information device, said location being accessible through the mobile information device network.

70. (Original) The intelligent agent of claim 60, wherein at least one characteristic of an appearance of said avatar is alterable.

71. (Original) The intelligent agent of claim 70, wherein at least one characteristic of an appearance of said avatar is alterable according to a user command.

72. (Original) The intelligent agent of claim 70, wherein a plurality of characteristics of an appearance of said avatar is alterable according to a predefined avatar skin.

73. (Original) The intelligent agent of claim 72, wherein said predefined avatar skin is predefined by the user.

74. (Original) The intelligent agent of claim 70, wherein said at least one characteristic of an appearance of said avatar is alterable according to an automated evolutionary algorithm.

75. (Original) The intelligent agent of claim 74, wherein said automated evolutionary algorithm comprises a genetic algorithm.

76. (Original) The intelligent agent of claim 60, wherein the mobile information device network comprises a locator for determining a physical location of the mobile information device, and wherein the user is able to request information about said physical location through an action of said agent.

77. (Original) The intelligent agent of claim 76, wherein said locator is capable of determining a second physical location relative to said physical location of the mobile information device, and wherein the user is able to request information about said second physical location through an action of said agent.

78. (Original) The intelligent agent of claim 77, wherein the user requests said second physical location according to a category.

79. (Original) The intelligent agent of claim 78, wherein said category is selected from the group consisting of a commercial location, a medical location, and a public safety location.

80. (Original) The intelligent agent of claim 78, wherein said category comprises a commercial location, and wherein said commercial location sends a message to the mobile information device according to said action of said agent.

81. (Original) The intelligent agent of claim 80, wherein said message comprises at least one of an advertisement or a coupon, or a combination thereof.

82. (Original) The intelligent agent of claim 80, wherein said agent filters said message according to at least one criterion.

83. (Original) The intelligent agent of claim 80, wherein said avatar presents at least information about said message to the user.

84. (Original) The intelligent agent of claim 77, wherein the user requests information about said second physical location through said avatar.

85. (Original) The intelligent agent of claim 60, wherein the mobile information device network is in communication with a virtual commercial location, and wherein the user communicates with said virtual commercial location through said avatar.

86. (Original) The intelligent agent of claim 85, wherein the user performs a purchase with said virtual commercial location through said avatar.

87. (Original) The intelligent agent of claim 85, wherein the user searches said virtual commercial location through said agent.

88. (Original) The intelligent agent of claim 85, wherein said avatar is capable of receiving an accessory purchased from said virtual commercial location.

89. (Original) The intelligent agent of claim 80, wherein the mobile information device is capable of receiving software, and wherein said agent performs at least a portion of installation of said software on the mobile information device.

90. (Original) The intelligent agent of claim 89, wherein the user interacts with said avatar for performing at least a portion of configuration of said software.

91. (Original) The intelligent agent of claim 60, wherein said agent further comprises a teaching module for teaching the user.

92. (Original) The intelligent agent of claim 91, wherein said teaching module is operative for teaching the user about at least one aspect of the mobile information device.

93. (Original) The intelligent agent of claim 91, wherein said teaching module is operative for teaching the user about at least one subject external to the mobile information device.

94. (Original) The intelligent agent of claim 60, wherein said avatar is capable of entertaining the user.

95. (Original) A living mobile telephone for a user, comprising:

an agent for controlling an interaction of the mobile telephone with the user; and

an avatar for providing a user interface with said agent.

96. (Original) The telephone of claim 95, wherein the telephone is connected to a mobile telephone network, and wherein said agent controls an interaction of the mobile telephone with said mobile telephone network.

97. (Original) The telephone of claim 95, wherein said agent comprises:

(i)   an artificial intelligence (AI) system; and

(ii)   a knowledge base;

wherein said AI system obtains information from said knowledge base for determining at least one action.

98. (Original) The telephone of claim 97, wherein said knowledge base comprises information about at least one user preference.

99. (Original) The telephone of claim 97, wherein said knowledge base comprises information about at least one user action pattern.

100. (Original) The telephone of claim 97, wherein said knowledge base comprises information about the user to an action by said agent.

101. (Original) The telephone of claim 100, wherein said knowledge base includes a disincentive for said agent to repeat an action after rejection by the user.

102. (Original) The telephone of claim 97, wherein said AI system determines a reward for said agent for performing an action, such that said action is selected according to said reward.

103. (Original) The telephone of claim 102, wherein said reward is determined according to information in said knowledge base.

104. (Original) The telephone of claim 102, wherein said AI system simulates a plurality of actions and selects an action for said agent according to said reward.

105. (Original)   The telephone of claim 97, wherein said AI system determines at least a portion of a user interface.

106. (Original) The telephone of claim 105, wherein said user interface includes at least one menu.

107. (Original) The telephone of claim 106, wherein said AI system at least partially constructs said at least one menu according to information in said knowledge base.

108. (New)   The method of claim 21, further comprising a user model for modeling behavior of the user.